

# SAS Functional Architecture

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# FCC Illustrative End-to-End CBRS Architecture

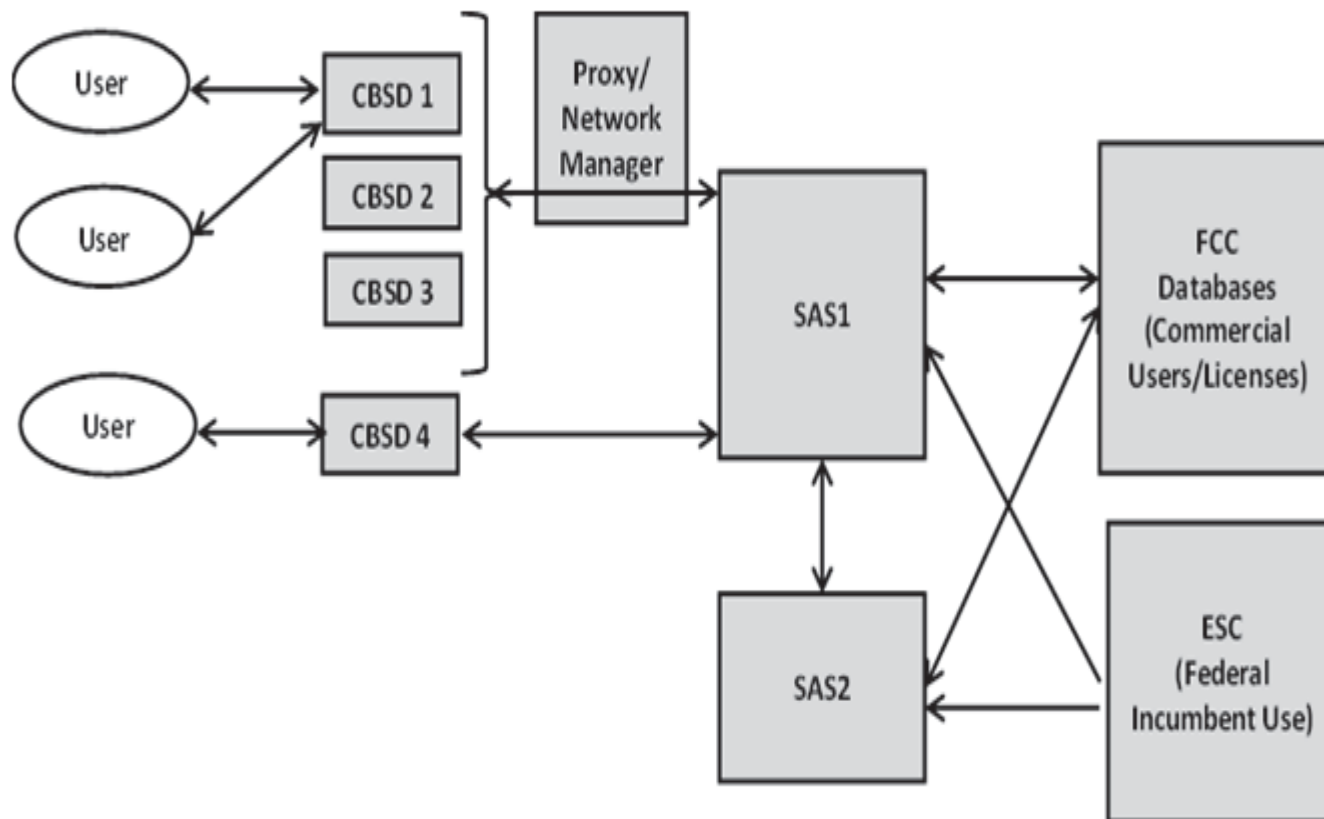
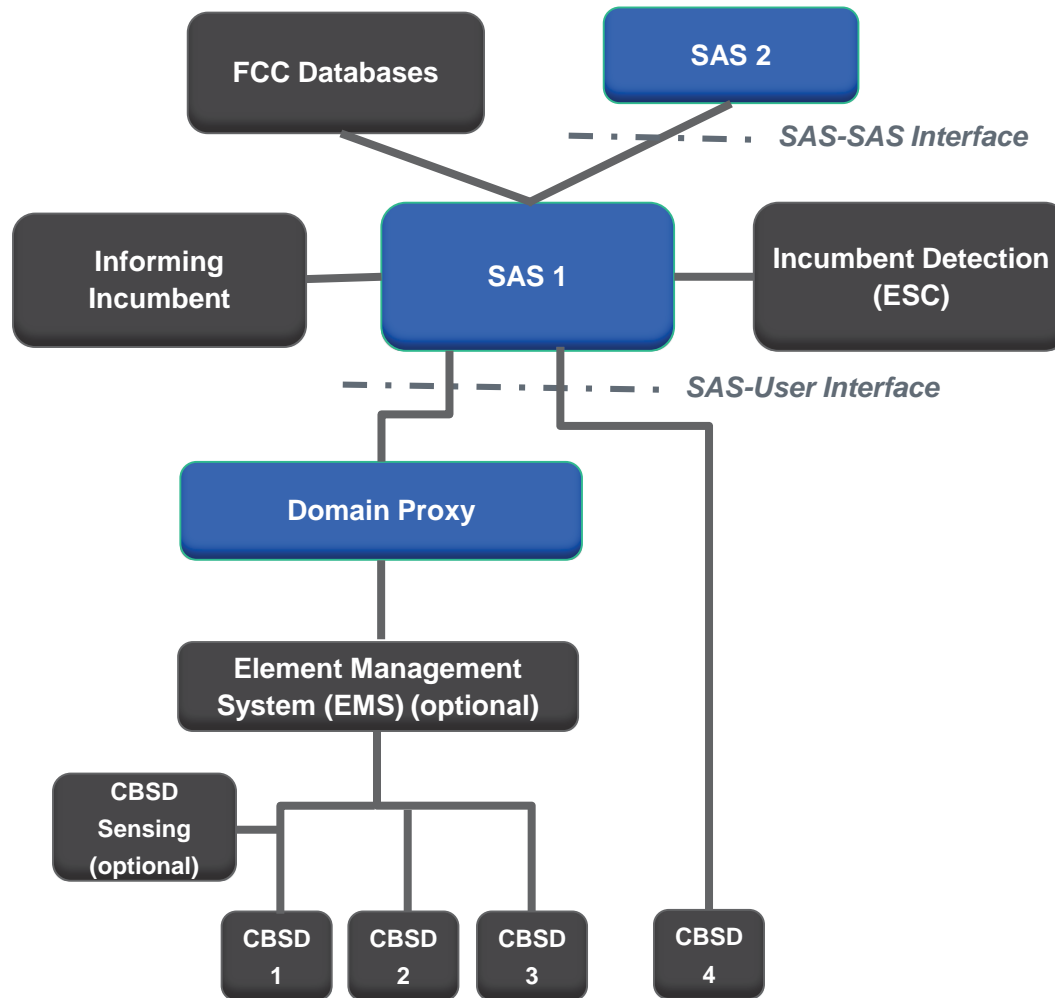


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# SAS – Functional Architecture



## Acronyms:

ESC: Environmental Sensing Capability

CBSD: Citizens Broadband Radio Service Device

SAS: Spectrum Access System

## Notes:

- A SAS may not need to support all interfaces.
- Each CBSD domain may optionally include some sensing capability (including possibly an ESC).

# Domain Proxy Functionality

**A Domain Proxy is a managing intermediary.**

**A Domain Proxy's function is to:**

- Accept a set of one or more available channels and select channels for use by specific CBSDs, or alternatively pass the available channels to the carrier EMS for CBSD channel selection
  - EMS may optionally be co-located with the domain proxy
- Back report selected channels to SAS optionally received via EMS
- Receives confirmation of channel assignment from SAS
- Performs bidirectional bulk CBSD registration and directive processing, optionally through carrier EMS if present.
- Perform bidirectional information processing and routing.
  - E.g. interference reporting, etc.

# SAS Purpose and Functionality

## (from FCC R&O, Annex A, 96.53)

- Enact and enforce all policies and procedures developed by the SAS Administrator pursuant to section 96.63.
- Determine and provide to CBSDs the permissible channels or frequencies at their location.
- Determine and provide to CBSDs the maximum permissible transmission power level at their location.
- Retain information on, and enforce, Exclusion Zones and Protection Zones in accordance with sections 96.15 and 96.17.
- Communicate with the ESC to obtain information about federal Incumbent User transmissions and instruct CBSDs to move to another frequency range or cease transmissions.
- Ensure that CBSDs operate in geographic areas and within the maximum power levels required to protect federal Incumbent Users from harmful interference, consistent with the requirements of sections 96.15 and 96.21.
- Register and authenticate the identification information and location of CBSDs.
- Ensure that CBSDs protect non-federal Incumbent Users from harmful interference, consistent with the requirements of section 96.17 and 96.21.
- Protect Priority Access Licensees from interference caused by other PALs and from General Authorized Access Users consistent with section 96.25.
- Facilitate coordination between GAA users operating Category B CBSDs, consistent with section 96.35.
- Resolve conflicting uses of the band while maintaining, as much as possible, a stable radio frequency environment.
- Ensure secure and reliable transmission of information between the SAS and CBSDs.
- Protect Grandfathered Wireless Broadband Licensees consistent with section 90.1307, 90.1338, and 96.21.
- Implement the terms of current and future international agreements as they relate to the Citizens Broadband Radio Service.

# SAS Core Functions (from FCC R&O, Para 320)

- Determine the available frequencies at a given geographic location and assign them to CBSDs;
- Determine the maximum permissible transmission power level for CBSDs at a given location and communicate that information to the CBSDs;
- Register and authenticate the identification information and location of CBSDs;
- Enforce Exclusion and Protection Zones, including any future changes to such Zones, to ensure compatibility between Citizens Broadband Radio Service users and incumbent federal operations;
- Communicate with the ESC and ensure that CBSDs operate in a manner that does not interfere with federal users;
- Ensure that CBSDs protect non-federal incumbent users consistent with the rules;
- Protect Priority Access Licensees from impermissible interference from other Citizens Broadband Radio Service users;
- Facilitate coordination between GAA users to promote a stable spectral environment;
- Ensure secure and reliable transmission of information between the SAS, ESC, and CBSDs;
- Provide an approved ESC with any sensing information reported by CBSDs if available;
- Protect Grandfathered Wireless Broadband Licensees until the end of the grandfather period;
- Facilitate coordination and information exchange between SASs.